REMARKS

Claims 1-5 and 10-20 are active. Claims 10-15 find support in original Claim 7. Claim 15 finds support in original Claim 1. The revision of Claim 6 finds support on page 11, line 23 of the specification. Claim 16 finds support on page 26, lines 6-9. Claims 17-18 find support in original Claims 8 and 9. Claims 19 and 20 find support on pages 9 and 10 of the specification, and on page 26, lines 6-9. Claim 21 finds support in original Claim 1. No new matter has been added.

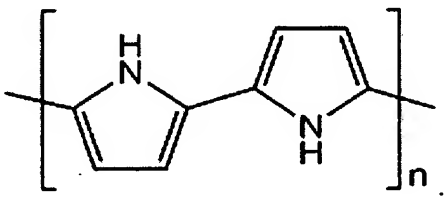
The Applicants thank Examiner Haq for the courteous and helpful interview of March 28, 2006 (Interview Summary mail date April 3, 2006). Differences between the method of the invention and prior art methods were reviewed. Amendments which would help address the prior art rejections were discussed.

Information Disclosure Statement

FR-A-2 750 136 corresponds to US-A-6,160,103. The attached Form 1149 indicates this correspondence.

Rejection—35 U.S.C. §112, second paragraph

Claims 1-9 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. This rejection is moot in view of the amendments above. Furthermore, the term "pyrrole polymer" is well-known in the art as referring to referring to polymers having a linkage such as:



The term "less than" which appears in new Claims 15 and 19 is accorded its standard meaning of smaller than 10 nm. Thus, it would encompass a thickness of 0.01 nm or 0.0001 nm, etc. Claim 3 has been amended in conventional process step format using the gerund "activating".

Rejection--35 U.S.C. §103

Claims 1-3 and 6-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Livache et al., Biosensors and Bioelectronics 13:629, in view of Guedon et al., Anal. Chem.

Livache differs from the method of the invention, because the pyrrole peptides are prepared by coupling a pyrrolyl residue to synthetic peptides using a dT10 oligonucleotide (DNA) linker (see page 630, col. 1, section 2.1). Livache does not describe how to couple a peptide directly to a pyrrole.

The Livache methods produces biochips by synthesizing a copolymer starting from an ODN (oligodeoxynucleotide) or a peptide substituted by a dT_{10} oligonucleotide linked to a pyrrole by reaction with a pyrrole solution (see Items 2.1 and 2.3 on page 630).

In Livache, the biomolecule (i.e. ODN or peptide) is not directly attached to a pyrrole ring because an additional specific oligonucleotide is interposed between the two molecular moieties (pyrrole on the one hand and ODN or peptide on the other hand).

Said method is applicable to the synthesis of oligonucleotides bearing a pyrrolyl moiety but cannot be used in the case of peptides because peptides are not synthesized according to the same linear operating procedure, the method is more complex and said complexity is increasingly growing with the number of peptides contained in the protein.

Indeed, proteins are generally prepared by bioengineering from living organisms into which are incorporated ADN (or ARN) fragments coding for the protein which allow the living organism to synthesize the protein.

In addition, in Item 3.4 of said reference, no information is given on the way "pyrrole peptides" are being obtained.

The application of the method used for "ODN pyr"(DNA) to proteins would involve the insertion of an oligonucleotide bearing a pyrrole in the protein structure upon synthesis. Such a step is quite difficult to carry out because the synthesis of protein is generally carried out by an essentially biological method.

Guedon et al. is non-analogous art, because it concerns oligonucleotides (DNA) and not proteins. DNA and proteins have materially different chemical groups and structures. Guedon disclose a surface Plasmon Resonance Imaging Method for specifically studying DNA and only DNA in a sample. The use of said method with peptides is not mentioned.

One with ordinary skill in the art would not combine these references, since applying the method disclosed in Livache would first lead to form a mixed structure comprising the protein to analyze to which an oligonucleotide bearing a pyrrole would be grafted.

Moreover, as discussed above, applying the concept disclosed in Livache could only lead to a protein-oligonucleotide conjugate, i.e. a polypeptide to which an oligonucleotide bearing a pyrrole would be grafted. The protein would then not be directly linked to pyrrole.

Moreover, inclusion of a foreign, non-protein moiety like an oligonucleotide segment would alter the fundamental biological structure of the protein to be attached to a substrate and subsequently analyzed. The primary structure of a polypeptide is essential to its activity and plays a major part in determining its secondary, tertiary and quaternary structures. Using oligonucleotides grafted to the protein of interest would bias most of the studies in the proteomics field that would be carried out on said protein because of the presence of these additional moieties which alter the essential structure of the protein of interest.

On the other hand, the present invention, contrary to the teachings of the prior art, requires directly linking a protein of interest to a pyrrole without any additional oligopeptide

being involved. The present inventors have illustrated the inventive method by providing several coupling methods which can be used according to the present invention to directly link the protein to an activated pyrrole. The coupling step of the present invention can be carried out on an isolated protein and not within the context of its synthesis contrary to the teachings of Livache. Accordingly, the Applicants respectfully request that this rejection be withdrawn.

Rejection--35 U.S.C. §103

Claims 1-3 and 6-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Livàche et al., Analytic Biochem., in view of Livache, Biosensors and Bioelectronics. Livache, Analytic Biochem. Describes a polypyrrole DNA chip and is non-analogous art, since the present invention involves coupling proteins and not DNA to pyrroles. Livache, Biosensors and Bioelectronics, has been addressed above and does not disclose direct binding a protein of interest to a pyrrole, but instead requires an interposed oligonucleotide moiety. Accordingly, this rejection may now be withdrawn.

Rejection--35 U.S.C. §103

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Livache, Biosensors and Bioelectronics, in view of Guedon et al., Anal. Chem. and further in view of Caillat et al., U.S. Patent No. 6,803,228. This rejection is moot in view of the arguments above with respect to Livache.

Rejection--35 U.S.C. §103

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over Livache, Biosensors and Bioelectronics, in view of Guedon et al., Anal. Chem. and Caillat et al., U.S.

Patent No. 6,803,228 and further in view of Bianchi et al., U.S. 2003/0207400 A1. This rejection is moot in view of the arguments above with respect to Livache.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully submit that this application is ready for allowance. Early notification of such is earnestly requested.

Respectfully submitted,

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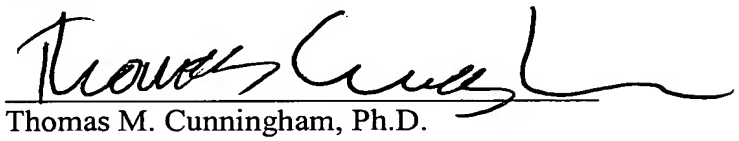
Norman F. Oblon



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